AMENDMENTS TO THE CLAIMS:

1. (Currently amended) An apparatus for high resolution imaging of a sample, comprising:

a SQUID evacuated dewar;

a SQUID sensor cooperating with the dewar to sense magnetic flux from the sample being imaged, said sensor having a detection coil;

a cold finger;

said dewar having a thin window;

means for mounting the sensor remotely from the coil;

the detection coil being electrically connected to the SQUID sensor;

a mechanism for mounting the detection coil at the distal end of the cold finger in close proximity to the thin window; ~~and~~

a radiation shield mounted within the dewar and having an extension surrounding the detection coil to help maintain its cold temperature; and ~~.~~

wherein the extension prevents or reduces circular currents in the plane of the detection coil.

2. (Currently amended) An apparatus according to claim 1, further including a ~~truck~~ thick backing window overlying the thin window on the vacuum side thereof.

3. (Currently amended) An apparatus according to claim 2, wherein said thick backing window includes a hole therein for receiving the detection coil and the distal end of the shield extension.

4. (Original) An apparatus according to claim 3, wherein the shield extension is conical and the window hole is tapered.

5. (Original) An apparatus according to claim 1, wherein the thin window is composed of sapphire material.

6. (Currently amended) An apparatus according to claim [[1]]2, wherein the thick backing window is composed of sapphire material.

7. (Original) An apparatus according to claim 1, further including a positioning mechanism for moving the detection coil adjustably toward and away from the thin window along a substantially straight path of travel.

8. (Original) An apparatus according to claim 7, wherein the positioning mechanism includes a lever.

9. (Original) An apparatus according to claim 8, wherein said positioning mechanism includes a flexure bearing.

10. (Original) An apparatus according to claim 1, wherein said detection coil is a bare SQUID magnetometer.

11. (Original) An apparatus according to claim 10, wherein said detection coil is an all-thin film SQUID magnetometer.

12. (Original) An apparatus according to claim 1, wherein said detection coil is a magnetometer coil connected to a SQUID sensor.

13. (Original) An apparatus according to claim 1, wherein said detection coil is a first derivative gradiometer.

14. (Original) An apparatus according to claim 1, wherein said detection coil is an asymmetric gradiometer.

15. (Original) An apparatus according to claim 1, wherein said detection coil is an apodized magnetometer coilgradiometer.

16. (Original) An apparatus according to claim 1, wherein said detection coil is a vector magnetometer.

17. (Original) An apparatus according to claim 1, wherein said detection coil is a gradiometer.

18. (Original) An apparatus according to claim 1, wherein said detection coil is a fractional turn SQUID magnetometer.

19. (Currently amended) A method of high resolution imaging of a sample, comprising:

sensing magnetic flux from the sample using a SQUID evacuated dewar and a SQUID sensor having a detection coil;

mounting the SQUID sensor within the dewar remotely of the detection coil;

mounting the detection coil at the distal end of a cold finger in close proximity to a thin window forming a part of the dewar; ~~and~~

mounting a radiation shield having an extension within the dewar and surrounding the detection coil; and.

using the extension to prevent or reduce circular currents in the plane of the detection coil via the extension.

20. (Original) A method according to claim 19, further including replacing the detection coil with another detection coil.

21. (Original) A method according to claim 19, further including a magnetic field to the sample being imaged prior to or during said sensing.

22. (New) An apparatus according to claim 1, wherein the extension includes at least one longitudinally extending slot.

23. (New) An apparatus according to claim 22, wherein

the extension being generally conical in shape; and

the upper portion of the extension being larger than the lower portion of the extension.

24. (New) An apparatus according to claim 1, wherein the extension is composed of aluminum.

25. (New) An apparatus according to claim 1, wherein the extension is composed of coil foil.

26. (New) An apparatus according to claim 1, wherein the extension is composed of G-10 fiber composite for reducing circular currents in the plane of the detection coil.

27. (New) An apparatus according to claim 1, further including a cold finger reservoir and a radiation shield reservoir.

28. (New) An apparatus according to claim 27, wherein the cold finger reservoir contains liquid helium.

29. (New) An apparatus according to claim 27, wherein the radiation shield reservoir contains liquid nitrogen.

30. (New) An apparatus according to claim 27, wherein the radiation shield surrounds the cold finger reservoir and the radiation shield reservoir.

31. (New) An apparatus according to claim 27, wherein the radiation shield reservoir is disposed above the cold finger reservoir.

32. (New) An apparatus according to claim 1, further including a bobbin having a tip; and a material disposed on the bobbin tip for cooling the pickup coil below the transition temperature.

33. (New) An apparatus according to claim 32, wherein the material is aluminum Mylar.

34. (New) An apparatus for high resolution imaging of a sample, comprising

a SQUID evacuated dewar;

a SQUID sensor mounted within the dewar for sensing magnetic flux from the sample being imaged;

a cold finger;

the dewar having a thin window;

a detection coil electrically coupled to the SQUID sensor;

means for mounting the detection coil at the tip of the cold finger in close proximity to the thin window;

a radiation shield mounted within the dewar and having an extension surrounding the detection coil;

a first reservoir for cooling the cold finger to a first temperature;

a second reservoir for cooling the radiation shield to a second temperature;

wherein the first temperature is substantially lower than the second temperature.

35. (New) An apparatus according to claim 34, wherein the first reservoir contains liquid helium.

36. (New) An apparatus according to claim 34, wherein the second reservoir contains liquid nitrogen.

37. (New) An apparatus according to claim 34, wherein the radiation shield surrounds the first and second reservoirs.

38. (New) A method according to claim 19, further including cooling the cold finger via a first reservoir at one temperature and cooling the radiation shield via a second reservoir at a substantially higher temperature.

39. (New) A method of high resolution imaging of a sample, comprising

sensing magnetic flux from the sample using a SQUID evacuated dewar and a SQUID sensor having a detection coil electrically coupled thereto;

mounting the SQUID sensor within the dewar;

mounting the detection coil at the end of a cold finger in close proximity to a thin window forming a part of the dewar;

mounting a radiation shield within the dewar and extending to the detection coil;

cooling the cold finger to a first temperature; and

cooling the radiation shield to a second temperature; and

wherein the first temperature is lower than the second temperature.